PATENT
071949-1307

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant:	Kenneth F. Buechler
Title:	DIAGNOSTIC DEVICES AND APPARATUS FOR THE CONTROLLED MOVEMENT OF REAGENTS WITHOUT MEMBRANES
Appl. No.:	09/613,650
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Examiner:	Alexander, Lyle
Art Unit :	1743

APPEAL BRIEF

Mail Stop Appeal Brief - Patents
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Sir:

Applicant (hereinafter "Appellant") hereby appeals the Final Rejection of claims 74-84 and 92-100. This Appeal Brief follows a Notice of Appeal filed November 30, 2006. The fee for this Appeal Brief (37 C.F.R. § 41.20(b)(2)) accompanies this filing. If the fee is absent or incorrect or if any additional fees are due in this regard, please charge or credit our Deposit Account No. 50-0872 for the appropriate amount.

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Real Party in Interest

The real party in interest in this appeal is Biosite Incorporated, which is the assignee of the present application.

Related Appeals and Interferences

U.S. Patent Application 10/153,423, which is presently on appeal, relates to the present application in so far as the claims relate to devices for handling of fluid samples, is also assigned to Biosite Incorporated, and has been examined by the same Examiner as the present application.

Status of Claims

Claims 1-73 and 85-91 have been cancelled.

Claims 74-84 and 92-100 are pending in the application. For the convenience of the Board, the pending claims are presented in Appendix A of this Brief.

Claims 74-84 and 92-100 are the subject of this appeal.

Claims 74-84 and 92-100 stand finally rejected under the judicially created doctrine of obviousness-type double patenting over U.S. Patent 5,458,852.

Claims 74-81 and 92-99 stand finally rejected under 35 U.S.C. §102(e), as allegedly being anticipated by Stöcker, U.S. Patent 4,647,543.

Claims 82 and 100 stand finally rejected under 35 U.S.C. §103(a) as allegedly being unpatentable over Stöcker, U.S. Patent 4,647,543.

Status of Amendments

In response to the obviousness-type double patenting rejection, a terminal disclaimer was submitted by Appellant on November 30, 2006. Appellant respectfully submits that this submission renders moot the rejection of claims 74-84 and 92-100 under the judicially created doctrine of obviousness-type double patenting. Thus, this rejection is not addressed below in the Appeal Brief.

As this is the only rejection pending for claims 83 and 84, Appellant believes that these claims are in condition for allowance pending acceptance of the terminal disclaimer.

No other amendments or submissions are pending in the application.

Summary of Claimed Subject Matter

The claimed subject matter relates in part to assay devices for measuring analytes of interest ("target ligands") in fluid samples. In particular, the present invention provides device components that provide for controlled movement of fluids in various regions of such devices.

Numerous test devices and systems that employ such devices have been developed over the years for measuring the presence or concentration of analytes in fluid samples, such as whole blood or urine. As discussed in some detail on pages 1 and 2 of the present specification, these devices typically employed test reagents and some sort of absorbent member through which the fluid sample flows. Typical absorbent members include paper materials, glass fiber mats, porous membranes, etc., which move fluids by capillary action. Specification, page 1, line 28, through page 2, line 24. Devices that rely on such porous materials can suffer from problems with consistency of capillary flow and binding characteristics from device batch to device batch. This is often because production of these porous materials is not easily reproducible in terms of their microscopic and macroscopic features. Specification, page 5, lines 3-12. In addition, devices previously known in the art often require precise delivery of fluids and careful handling of reagents, and so must be used by relatively skilled users in a laboratory setting. Specification, page 2, lines 25-28.

To avoid such issues, the present invention relates to assay devices that rely on one or more nonporous surfaces having defined surface characteristics to regulate fluid flow. By carefully controlling the surface characteristics of the nonporous surface used, the present invention provides devices that do not require precise fluid handling or carefully timed incubations. Instead, the device may be used in a "fill-and-forget" fashion, in which the characteristics of the surface provide for regulated fluid flow. Specification, page 5, line 3, through page 6, line 6. One method for directing flow through specific regions of the device, and in particular for directing materials only to certain areas of a "diagnostic element" that captures target ligands for detection, involves delimiting certain regions of an otherwise hydrophilic surface with hydrophobic materials. Specification, page 27, line 31, through page 28, line 7. Arranging the device surface in this manner preferentially directs fluid flow to desired areas of the device, as fluid will tend to remain in the areas that are hydrophilic, and be repelled from areas that are hydrophobic.

Thus, the present invention claims assay devices for detecting a plurality of target ligands in a sample. As defined in independent claim 74, these devices comprise:

(a) a nonporous smooth surface or a nonporous textured surface; and

(b) a plurality of discrete capture zones on the surface, where each said capture zone comprises receptors immobilized to the surface or immobilized on particles immobilized to said surface, and where the receptors are capable of binding one or more of the plurality of target ligands being detected;

(c) wherein the capture zones occupy one or more discrete hydrophilic regions of said surface delimited by an adjacent hydrophobic region of said surface.

Further defining these devices, claim 74 also states (i) if the surface is the nonporous textured surface, the texture comprises one or more depressions or protrusions extending between 1 nm and 0.5 mm from the surface; and (ii) if the receptors are immobilized on particles, the particle size range is from 1 nm to 5 μm. Support for claim 74 is found in the application, for example at p. 5, lines 3-5; p. 7, lines 26-29; p. 15, lines 26-27; p. 17, lines 5-6; p.23, lines 24-27, p. 25, lines 1-19 and 22-29; p. 28, lines 11-16 and 21-24; and Figure 3.

In various dependent claims, the devices are further defined as comprising specific types of receptors (claims 75, 77, 78, and 80), as having discrete capture zones that each bind a different target ligand (claim 76), as comprising immobilized particles (claim 79), as comprising a textured surface, where the particles are entrapped within depressions in the surface (claim 81), as comprising specific types of particles (claim 82), as having a second surface that forms a capillary space with the nonporous surface (claim 83), and as not being part of a capillary space (claim 84).

Support for 75, 77, 78, and 80 is found in the application, for example at p. 9, lines 19-21; support for claim 76 is found in the application, for example at p. 25, lines 8-9; support for claim 79 is found in the application, for example at p. 25, lines 24-31; support for claim 81 is found in the application, for example at p. 28, lines 11-16; support for claim 82 is found in the application, for example at p. 25, lines 22-29; support for claim 83 is found in the application, for example at p. 5, lines 29-32; and support for claim 84 is found in the application, for example at p. 26, lines 15-21.

In independent claim 92, the claimed devices comprise an additional element not specifically recited in independent claim 74: that the capture zones are located in one or more diagnostic elements. Support for claim 92 is described in the specification, for example, at page 31, lines 16-19. Following this claim, the devices are further defined as comprising specific types of receptors (claims 93, 95, 96, and 98), as having discrete capture zones that each bind a different target ligand (claim 94), as comprising immobilized particles (claim 97), as comprising a textured surface, where the particles are entrapped within depressions in the surface (claim 99), and as comprising specific types of particles (claim 100).

Support for claims 93, 95, 96, and 98 is found in the application, for example at p. 9, lines 19-21; support for claim 94 is found in the application, for example at p. 25, lines 8-9; support for claim 97 is found in the application, for example at p. 25, lines 24-31; support for claim 99 is found in the application, for example at p. 28, lines 11-16; and support for claim 100 is found in the application, for example at p. 25, lines 22-29.

Grounds for Rejection to be Reviewed on Appeal

1. The rejection of claims 74 and 92 under 35 U.S.C. §102(e), as allegedly being anticipated by Stöcker, U.S. Patent 4,647,543 (hereinafter "the '543 patent").

2. The rejection of claims 75 and 93 under 35 U.S.C. §102(e), as allegedly being anticipated by the '543 patent.

3. The rejection of claims 76 and 94 under 35 U.S.C. §102(e), as allegedly being anticipated by the '543 patent.

4. The rejection of claims 77 and 95 under 35 U.S.C. §102(e), as allegedly being anticipated by the '543 patent.

5. The rejection of claims 78 and 96 under 35 U.S.C. §102(e), as allegedly being anticipated by the '543 patent.

6. The rejection of claims 79 and 97 under 35 U.S.C. §102(e), as allegedly being anticipated by the '543 patent.

7. The rejection of claims 80 and 98 under 35 U.S.C. §102(e), as allegedly being anticipated by the '543 patent.

8. The rejection of claims 81 and 99 under 35 U.S.C. §102(e), as allegedly being anticipated by the '543 patent.

9. The rejection of claims 82 and 100 under 35 U.S.C. §103(a), as allegedly being unpatentable over the '543 patent.

Argument

1. Rejection of claims 74 and 92 under 35 U.S.C. §102(e)

Appellant respectfully submits that the Examiner has failed to establish a *prima facie* case of anticipation under 35 U.S.C. § 102(e) for claims 74 and 92 as allegedly being anticipated by the '543 patent. The Examiner's recitation of features from the '543 patent does not properly address the claimed elements. Moreover, when the claimed elements are properly addressed, it is clear that the '543 patent does not provide each and every element set forth in the claims. For these reasons, Appellant respectfully requests that the rejection of claims 74 and 92 be withdrawn or reversed.

The entirety of the Examiner's reasons for the rejection is contained in the Office Action mailed February 7, 2006:

> Stocker teaches a device for immunological testing of immobilized samples. Figure 6(a) a plate (2) comprising supports (1a) within a hydrophilic area (3) for sample capture and a surrounding hydrophobic area (4). This has been read on the claimed hydrophilic/capture zones. Support 1(a) has been read on the claimed particles that immobilize the sample. Column 5 lines 59+ and claim 8 teach that the surface is not flat and has "depressions" where the sample can be trapped. This has been read on the claimed "textured surface."

It is clear from the Examiner's reasoning that the plain language of the claims has not been properly considered, and that, for this reason, the teachings of the '543 patent have not been properly applied to claims 74 and 92. Specifically, whether or not the '543 patent "teaches a device for immunological testing of immobilized samples" is not relevant to the present claims. Instead, the claimed devices use immobilized receptors that bind target ligands from a sample. Likewise, the Examiner's conclusion that support 1(a) of the '543 patent "has been read on the claimed particles that immobilize the sample" is equally irrelevant to claims 74 and 92 because nowhere do these claims refer to "particles that immobilize the sample."

The Examiner has the initial burden of establishing a *prima facie* case of anticipation by pointing out where all of the claim limitations appear in a single reference. *See*, *In re Spada*, 911 F.2d 705, 708, 15 USPQ2d 1655, 1657 (Fed. Cir. 1990); *In re King*, 801 F.2d 1324, 1326, 231 USPQ 136, 138 (Fed. Cir. 1986). For whatever reason, the Examiner has applied the cited '543 patent to language that does not exist in claims 74 and 92. As such, the Examiner's analysis fails to support a *prima facie* case of anticipation.

Furthermore, even if the language used in the claims is properly considered, it is apparent that the '543 patent does not provide each and every element set forth in claims 74 and 92. The rejected claims refer to a device having a nonporous smooth or nonporous textured surface, and a plurality of discrete capture zones on that surface. The claims also specify that each capture zone comprises receptor immobilized to said surface *or* immobilized on particles immobilized to said surface, the receptor being capable of binding one or more of said plurality of target ligands. Furthermore, the capture zones occupy one or more discrete hydrophilic regions of said surface, and are delimited by an adjacent hydrophobic region of said surface.

The plain language of claims 74 and 92 makes it abundantly clear that "receptor immobilized to said surface" refers to a first option, in which receptor that is attached to either the nonporous smooth or nonporous textured surface. The claims also refer in the alternative to a second option, in which receptor is attached to a separate solid phase, specifically a particle having the dimensions of between 1 nm and 5 μm, which particle is then attached to the nonporous smooth or nonporous textured surface.

As the Examiner correctly notes with reference to Figure 6(a), the '543 patent discloses a plate **2** that might correspond to the nonporous smooth or nonporous textured surface referred to in claims 74 and 92. This plate has a plurality of "hydrophilic reaction fields **3** and hydrophobic surrounding area **4**. '543 patent, column 5, lines 10-13. But at least one feature of claims 74 and 92 is missing from the device depicted in Figure 6 of the '543 patent -- the receptor capable of binding one or more of said plurality of target ligands immobilized to said surface or immobilized on particles immobilized to said surface.

Nothing in the '543 patent discloses immobilizing any biological material (*e.g.*, a receptor as in claims 74 and 92) to plate **2**, and, in fact, the Examiner does not assert that any

section of the '543 patent contemplates such attachment. As such, the '543 patent does not teach the first option in the claims for immobilizing a receptor (that is, receptor immobilized to the non-porous smooth or non-porous textured surface).

The Examiner does, however, refer to "Support 1(a)"in the reference, which the Examiner indicates "has been read on the claimed particles that immobilize the sample." Thus, the rejection is apparently premised on an assertion that the '543 patent allegedly teaches the second option in the claims (that is, receptor immobilized on particles that are themselves immobilized to the nonporous smooth or nonporous textured surface).

According to claims 74 and 92, when particles are used as a separate solid phase to which a receptor is attached, those particles have a dimension of between 1 nm and 5 μm. In contrast, the support **1a** in the '543 patent are at least 40 times larger than the largest dimension recited in the claims. As discussed in column 7, lines 37-39 and 49-51 of the '543 patent, the supports are made from glass "cover slips," which are used so that a tissue sample may be emplaced on a large support, and the support then divided into smaller fragments, the smallest fragment dimension being 200 μm.

In order to anticipate a claim, a single prior art reference must provide each and every element set forth in the claim. Furthermore, the claims must be interpreted in light of the teaching of the specification. *In re Bond*, 15 USPQ2d 1566, 1567 (Fed. Cir. 1990). *See also* MPEP § 2131. Because the '543 patent does not disclose each and every limitation of the claimed invention, no *prima facie* case of anticipation has been established. In view of the foregoing, Appellant respectfully requests that the rejection of claims 74 and 92 be withdrawn or reversed.

2. Rejection of claims 75 and 93 under 35 U.S.C. §102(e)

Appellant respectfully submits that the Examiner has failed to establish a *prima facie* case of anticipation under 35 U.S.C. § 102(e) for claims 75 and 93 as allegedly being anticipated by the '543 patent. Because claims 75 and 93 contain each of the elements present in independent claims 74 and 92, respectively, the rejection fails for the reasons discussed regarding the independent claims. Specifically, the Examiner's recitation of features from the

'543 patent does not properly address the claimed elements, and when the claimed elements are properly addressed, it is clear that the '543 patent does not provide each and every element set forth in the claims.

Claims 75 and 93 further limit their respective independent claim, in that claims 75 and 93 specify that each capture zone comprises receptors independently selected from the group consisting of antibodies, antibody fragments, nucleic acid molecules, and chelators. Nothing in the Examiner's statement of rejection indicates where such a teaching may be found in the '543 patent. Because the Examiner has the initial burden of establishing a *prima facie* case of anticipation by pointing out where all of the claim limitations appear in a single reference, the Examiner's failure to address the limitations of claims 75 and 93 fails to establish a *prima facie* case of anticipation of the claims.

The Examiner's response to Appellant's request for additional clarity on where such support might be found in the '543 patent is instructive, in that it again reinforces the fact that the Examiner continues to apply the '543 patent to language that does not exist in the rejected claims. The Examiner relies on column 10, lines 1-30, of the '543 patent for an alleged teaching of "antibodies to bind the ligands of interest." Office Action mailed August 31, 2006, page 4, second full paragraph. The cited portion of the '543 patent, however, is unavailing because it refers to detecting soluble antibodies in a serum sample by binding to an immobilized tissue section. In contrast, the rejected claims refer to detecting an analyte of interest in a sample by binding to immobilized antibodies. Thus, while the Examiner may be correct that column 10, lines 1-30, of the '543 patent refers to antibodies, the antibodies in the reference are not equivalent to the antibodies recited in the rejected claims, as the antibodies of the '543 patent are not capable of binding one or more of a plurality of target ligands. Instead, the antibodies of the '543 patent are the target ligands.

For these reasons, Appellant respectfully requests that the rejection of claims 75 and 93 be withdrawn or reversed.

3. Rejection of claims 76 and 94 under 35 U.S.C. §102(e)

Appellant respectfully submits that the Examiner has failed to establish a *prima facie* case of anticipation under 35 U.S.C. § 102(e) for claims 76 and 94 as allegedly being anticipated by the '543 patent. Because claims 75 and 93 contain each of the elements present in independent claims 74 and 92, respectively, the rejection fails for the reasons discussed regarding the independent claims. Specifically, the Examiner's recitation of features from the '543 patent does not properly address the claimed elements, and when the claimed elements are properly addressed, it is clear that the '543 patent does not provide each and every element set forth in the claims.

Claims 76 and 94 further limit their respective independent claim, in that claims 76 and 94 specify that each capture zone binds a different target ligand from amongst the plurality of target ligands being detected. Nothing in the Examiner's statement of rejection indicates where such a teaching may be found in the '543 patent. Because the Examiner has the initial burden of establishing a *prima facie* case of anticipation by pointing out where all of the claim limitations appear in a single reference, the Examiner's failure to address the limitations of claims 76 and 94 cannot establish a *prima facie* case of anticipation of the claims.

For these reasons, Appellant respectfully requests that the rejection of claims 76 and 94 be withdrawn or reversed.

4. Rejection of claims 77 and 95 under 35 U.S.C. §102(e)

Appellant respectfully submits that the Examiner has failed to establish a *prima facie* case of anticipation under 35 U.S.C. § 102(e) for claims 77 and 95 as allegedly being anticipated by the '543 patent. Because claims 77 and 95 contain each of the elements present in independent claims 74 and 92, respectively, the rejection fails for the reasons discussed regarding the independent claims. Specifically, the Examiner's recitation of features from the '543 patent does not properly address the claimed elements, and when the claimed elements are properly addressed, it is clear that the '543 patent does not provide each and every element set forth in the claims.

Claims 77 and 95 further depend from claims 76 and 94, and thus require that each capture zone binds a different target ligand from amongst the plurality of target ligands being detected. Claims 77 and 95 further provide that the target ligands are nucleic acids, and that each capture zone comprises a nucleic acid molecule complementary to one of these target ligands. Nothing in the Examiner's statement of rejection indicates where such a teaching may be found in the '543 patent. Because the Examiner has the initial burden of establishing a *prima facie* case of anticipation by pointing out where all of the claim limitations appear in a single reference, the Examiner's failure to address the limitations of claims 77 and 95 cannot establish a *prima facie* case of anticipation of that claim.

For these reasons, Appellant respectfully requests that the rejection of claims 77 and 95 be withdrawn or reversed.

5. Rejection of claims 78 and 96 under 35 U.S.C. §102(e)

Appellant respectfully submits that the Examiner has failed to establish a *prima facie* case of anticipation under 35 U.S.C. § 102(e) for claims 78 and 96 as allegedly being anticipated by the '543 patent. Because claims 78 and 96 contain each of the elements present in independent claims 74 and 92, respectively, the rejection fails for the reasons discussed regarding the independent claims. Specifically, the Examiner's recitation of features from the '543 patent does not properly address the claimed elements, and when the claimed elements are properly addressed, it is clear that the '543 patent does not provide each and every element set forth in the claims.

Claims 78 and 96 further depend from claims 76 and 94, and thus require that each capture zone binds a different target ligand from amongst the plurality of target ligands being detected. Claims 78 and 96 further provide that each capture zone comprises an antibody or antibody fragment that binds to one of these target ligands. Nothing in the Examiner's statement of rejection indicates where such a teaching may be found in the '543 patent. Because the Examiner has the initial burden of establishing a *prima facie* case of anticipation by pointing out where all of the claim limitations appear in a single reference, the Examiner's failure to address the limitations of claims 78 and 96 cannot establish a *prima facie* case of anticipation of the claims.

For these reasons, Appellant respectfully requests that the rejection of claims 78 and 96 be withdrawn or reversed.

6. Rejection of claims 79 and 97 under 35 U.S.C. §102(e)

Appellant respectfully submits that the Examiner has failed to establish a *prima facie* case of anticipation under 35 U.S.C. § 102(e) for claims 79 and 97 as allegedly being anticipated by the '543 patent. Because claims 79 and 97 contain each of the elements present in independent claims 74 and 92, respectively, the rejection fails for the reasons discussed regarding the independent claims. Specifically, the Examiner's recitation of features from the '543 patent does not properly address the claimed elements, and when the claimed elements are properly addressed, it is clear that the '543 patent does not provide each and every element set forth in the claims.

Referring to terms used in the foregoing discussion of independent claims 74 and 92, claims 79 and 97 each further limit their respective independent claim, in that claims 79 and 97 specify that one or more of the capture zones rely on the second option for immobilizing receptor -- that in which receptor is attached to a separate solid phase, specifically a particle having the dimensions of between 1 nm and 5 μm, and the particles are themselves immobilized on the nonporous surface. As noted above, the support **1a** in the '543 patent (which the Examiner reads on the particles in the rejected claims) are at least 40 times larger than the largest dimension recited in the claims. As discussed in column 7, lines 37-39 and 49-51, the supports in the '543 patent are made from glass "cover slips," which are used so that a tissue sample may be emplaced on a large support, and the support then divided into smaller fragments, the smallest being 200 μm.

Because the '543 patent does not disclose each and every limitation of the claimed invention, no *prima facie* case of anticipation has been established. Appellant, therefore, respectfully requests that the rejection of claims 79 and 97 be withdrawn or reversed.

7. Rejection of claims 80 and 98 under 35 U.S.C. §102(e)

Appellant respectfully submits that the Examiner has failed to establish a *prima facie* case of anticipation under 35 U.S.C. § 102(e) for claims 80 and 98 as allegedly being anticipated

by the '543 patent. Because claims 80 and 98 contain each of the elements present in independent claims 74 and 92, respectively, the rejection fails for the reasons discussed regarding the independent claims. Specifically, the Examiner's recitation of features from the '543 patent does not properly address the claimed elements, and when the claimed elements are properly addressed, it is clear that the '543 patent does not provide each and every element set forth in the claims.

Claims 80 and 98 further depend from claims 79 and 97, and thus require that one or more of the capture zones rely on the second option for immobilizing receptor -- that in which receptor is attached to a separate solid phase, specifically a particle having the dimensions of between 1 nm and 5 μm, and the particles are themselves immobilized on the nonporous surface. Claims 80 and 98 further provide that the receptors are antibodies or antibody fragments.

Nothing in the Examiner's statement of rejection indicates where such a teaching may be found in the '543 patent, with the possible exception of the Examiner's reference to column 10, lines 1-30, of the '543 patent for an alleged teaching of "antibodies to bind the ligands of interest." Office Action mailed August 31, 2006, page 4, second full paragraph. As discussed above, however, that section of the '543 patent refers to detecting soluble antibodies in a serum sample by binding to an immobilized tissue section. In contrast, the rejected claims refer to detecting an analyte of interest in a sample by binding to immobilized antibodies. Thus, while the Examiner may be correct that column 10, lines 1-30, of the '543 patent refers to antibodies, the antibodies in the reference are not equivalent to those recited in the rejected claims.

Because the Examiner has the initial burden of establishing a *prima facie* case of anticipation by pointing out where all of the claim limitations appear in a single reference, the Examiner's failure to address the limitations of claims 80 and 98 cannot establish a *prima facie* case of anticipation of that claim.

For these reasons, Appellant respectfully requests that the rejection of claims 78 and 96 be withdrawn or reversed.

8. Rejection of claims 81 and 99 under 35 U.S.C. §102(e)

Appellant respectfully submits that the Examiner has failed to establish a *prima facie* case of anticipation under 35 U.S.C. § 102(e) for claims 81 and 99 as allegedly being anticipated by the '543 patent. Because claims 81 and 99 contain each of the elements present in independent claims 74 and 92, respectively, the rejection fails for the reasons discussed regarding the independent claims. Specifically, the Examiner's recitation of features from the '543 patent does not properly address the claimed elements, and when the claimed elements are properly addressed, it is clear that the '543 patent does not provide each and every element set forth in the claims.

Claims 80 and 98 further depend from claims 79 and 97, and thus require that one or more of the capture zones rely on the second option for immobilizing receptor -- that in which receptor is attached to a separate solid phase, specifically a particle having the dimensions of between 1 nm and 5 μm, and the particles are themselves immobilized on the nonporous surface. Claims 80 and 98 further provide that the nonporous surface is a textured surface, and one or more of the particles are entrapped within depressions and/or between protrusions on the textured surface. Nothing in the Examiner's statement of rejection indicates where such a teaching may be found in the '543 patent.

Because the Examiner has the initial burden of establishing a *prima facie* case of anticipation by pointing out where all of the claim limitations appear in a single reference, the Examiner's failure to address the limitations of claims 81 and 99 cannot establish a *prima facie* case of anticipation of the claims.

For these reasons, Appellant respectfully requests that the rejection of claims 78 and 96 be withdrawn or reversed.

9. Rejection of claims 82 and 100 under 35 U.S.C. §103(a)

Appellant respectfully submits that the Examiner has failed to establish a *prima facie* case of obviousness under 35 U.S.C. § 103(a) for claims 82 and 100 over the '543 patent.

A. The '543 patent does not teach or suggest all of the claim elements

Claim 82 depends from claim 79, which in turn depends from claim 74. Similarly, claim 100 depends from claim 97, which in turn depends from claim 92. Thus, claims 82 and 100 contain all of the limitations of these claims from which the depend, and add the additional limitation that the particles on which receptor is immobilized, and which are themselves immobilized on the nonporous surface, are selected from the group consisting of latex particles, silica particles, zirconia particles, alumina particles, titania particles, ceria particles, metal sol particles, and polystyrene particles.

The Examiner has taken the position that the only deficiency between the '543 patent and claims 82 and 100 are the additional limitations in these claims that recite specific materials from which the particles are made. Office Action mailed February 7, 2006, page 3. As Appellant has discussed in detail above with regard to the anticipation rejection of claims 74 and 92, the Examiner's position in this regard is incorrect. Without repeating the argument here, the '543 patent fails to disclose or suggest a nonabsorbent surface having a plurality of discrete capture zones, each comprising receptors immobilized to the surface or immobilized on particles immobilized to the surface, where the capture zones occupy one or more discrete hydrophilic regions of the surface and delimited by an adjacent hydrophobic region of the surface.

Appellant's remarks herein demonstrate that the Examiner's reasoning for rejecting claims 74 and 92, from which claims 82 and 100 depend, does not properly address the elements actually present in claims 74 and 92. Furthermore, when those elements are properly considered, it is apparent that the '543 patent does not disclose, or even suggest, each and every limitation of the claims. Moreover, the Examiner has not even addressed the elements of claims 79 and 97, from which claims 82 and 100 also depend.

B. The Examiner has not established any motivation to modify the '543 patent to arrive at the claimed invention

The noted deficiencies in the '543 patent cannot be cured without additional teachings, which are notably lacking from this obviousness rejection. Furthermore, because the Examiner incorrectly presumes that the '543 patent anticipated the claims from which claims 82 and 100 depend, the Examiner has not established any motivation or reasoning for the skilled artisan to modify the teachings of the '543 patent in order to actually arrive at the invention claimed in claims 82 and 100.

As far as the Examiner's remarks concerning the additional limitations added by claims 82 and 100, the Examiner relies on an assertion that the '543 patent "is silent to the material construction of particles," and that the sort of materials recited in claims 82 and 100 are "well known for their inertness, availability, and long track record of use with immunological materials." Office Action mailed February 7, 2006, page 3. But the '543 patent is not silent on the composition of the supports used to immobilize tissue samples, as the Examiner asserts. In fact, in all cases, the supports in the '543 patent are made of thin glass. Glass "cover slip" material is selected for use in the '543 patent so that a tissue sample may be emplaced on a large support, and the support then divided into smaller fragments by breaking or cutting, such that each resulting glass fragment contains some of the tissue sample. *See, e.g.*, '543 patent, column 7, lines 33-66; Examples 1 and 2; and claims.

Nothing of record indicates that materials such as latex, zirconia, alumina, and titanium, whatever their "long track record" for other uses, could be processed in the manner that the glass supports disclosed in the '543 patent are processed without destroying the specimen emplaced thereon. Thus, there is no reasoning provided by the Examiner as to why the skilled artisan might consider using materials such as latex, zirconia, alumina, and titanium in place of glass cover slips.

In analyzing obviousness, the Court of Appeals for the Federal Circuit has repeatedly cautioned that:

> [t]he factual inquiry . . . must be based upon objective evidence of record . . . . [T]he best defense against the subtle but powerful attraction of a hindsight-based obviousness analysis is rigorous application of the requirement for a showing of the teaching or motivation to combine prior art references . . . . [P]articular findings must be made as to the reason the skilled artisan, with no knowledge of the claimed invention, would have selected these components for combination in the manner claimed.

In re Sang-Su Lee, 277 F.3d 1338, 1343, 61 USPQ2d 1430, 1433 (Fed. Cir. 2002) (internal citations omitted). Apellant respectfully submits that, without knowledge of the presently claimed invention, the skilled artisan would not be motivated to utilize the materials recited in claims 82 and 100 in place of the thin glass cover slip supports disclosed in the '543 patent, as such a modification would render the resulting tissue supports unsatisfactory for their intended

purpose.

C. No prima facie case of obviousness has been established

The Examiner bears the initial burden of establishing a *prima facie* case of obviousness. MPEP § 2142. In the present case, the Examiner has not met that burden. The '543 patent does not teach or suggest each and every element of the present claims, and no motivation has been established to modify the '543 patent to provide each of the elements of the present claims. In addition, no motivation has been established for using materials such as latex, zirconia, alumina, and titanium in place of the glass cover slips used in the '543 patent. In view of the foregoing, Appellant respectfully requests that the rejection of claims 82 and 100 under 35 U.S.C. § 103(a) be withdrawn or reversed.

Conclusion

For the reasons discussed above, Appellant respectfully submits that claims 74-84 and 92-100 are in condition for allowance, and respectfully request that the rejections be withdrawn or reversed, and that the claims be allowed to issue.

Respectfully submitted,

Date: 01/22/2007

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Appendix A: Text of the Claims Involved in the Appeal

74. An assay device for detecting a plurality of target ligands in a sample, comprising:

a nonporous smooth surface or a nonporous textured surface, said nonporous textured surface comprising one or more depressions or protrusions extending between 1 nm and 0.5 mm from said nonporous textured surface; and

a plurality of discrete capture zones on said surface, each said capture zone comprising receptors immobilized to said surface or immobilized on particles immobilized to said surface, wherein said particle size range is from 1 nm to 5 μm, and wherein said receptors are capable of binding one or more of said plurality of target ligands,

wherein said capture zones occupy one or more discrete hydrophilic regions of said surface delimited by an adjacent hydrophobic region of said surface.

75. An assay device according to claim 74, wherein each said discrete capture zone comprises receptors independently selected from the group consisting of antibodies, antibody fragments, nucleic acid molecules, and chelators.

76. An assay device according to claim 74, wherein each said discrete capture zone binds a different target ligand from amongst said plurality of target ligands.

77. An assay device according to claim 76, wherein said plurality of target ligands are a plurality of nucleic acid molecules, and each said discrete capture zone comprises a nucleic acid molecule having a nucleotide sequence that is complementary to one of said plurality of nucleic acid molecules.

78. An assay device according to claim 76, wherein each said discrete capture zone comprises an antibody, or a fragment thereof, capable of binding one of said plurality of target ligands.

79. An assay device according to claim 74, wherein one or more of said discrete capture zones comprise one or more particles immobilized to said surface, wherein said receptors are immobilized on said particles.

80. An assay device according to claim 79, wherein said receptors are antibodies, or fragments thereof.

81. An assay device according to claim 79, wherein said surface is said textured surface, and one or more of said particles are entrapped within depressions and/or between protrusions on the textured surface.

82. An assay device according to claim 79, wherein said particles are selected from the group consisting of latex particles, silica particles, zirconia particles, alumina particles, titania particles, ceria particles, metal sol particles, and polystyrene particles.

83. An assay device according to any one of claims 74-82 and 92-100, wherein said nonporous surface forms a capillary space between said nonporous surface and a second surface spaced at a capillary forming distance from said nonporous surface.

84. An assay device according to any one of claims 74-82 and 92-100, wherein said nonporous surface is not part of a capillary space.

85-91. Cancelled.

92. An assay device for detecting a plurality of target ligands in a sample, comprising:

a nonporous smooth surface or a nonporous textured surface, said nonporous textured surface comprising one or more depressions or protrusions extending between 1 nm and 0.5 mm from said nonporous textured surface; and

a plurality of discrete capture zones on said surface, each said capture zone comprising receptors immobilized thereon to said surface or immobilized on particles immobilized to said surface, wherein said particle size range is from 1 nm to 5 μm, and wherein said receptors are capable of binding one or more of said plurality of target ligands,

wherein said capture zones are located in one more diagnostic elements of said surface, said diagnostic elements being hydrophilic and delimited by one or more adjacent hydrophobic regions of said surface.

93. An assay device according to claim 92, wherein each said discrete capture zone comprises receptors independently selected from the group consisting of antibodies, antibody fragments, nucleic acid molecules, and chelators.

94. An assay device according to claim 92, wherein each said discrete capture zone binds a different target ligand from amongst said plurality of target ligands.

95. An assay device according to claim 94, wherein said plurality of target ligands are a plurality of nucleic acid molecules, and each said discrete capture zone comprises a nucleic acid molecule having a nucleotide sequence that is complementary to one of said plurality of nucleic acid molecules.

96. An assay device according to claim 94, wherein each said discrete capture zone comprises an antibody, or a fragment thereof, capable of binding one of said plurality of target ligands.

97. An assay device according to claim 92, wherein one or more of said discrete capture zones comprise one or more particles immobilized to said surface, wherein said receptors are immobilized on said particles.

98. An assay device according to claim 97, wherein said receptors are antibodies, or fragments thereof.

99. An assay device according to claim 97, wherein said surface is said textured surface, and one or more of said particles are entrapped within depressions and/or between protrusions on the textured surface.

100. An assay device according to claim 97, wherein said particles are selected from the group consisting of latex particles, silica particles, zirconia particles, alumina particles, titania particles, ceria particles, metal sol particles, and polystyrene particles.

Appendix B: Evidence Appendix

U.S. Patent 4,647,543

U.S. Patent 5,458,852

Appendix C: Related Appeals and Interferences

U.S. Patent Application 10/153,423.